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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,707

10/27/2005

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EXAMINER

NGUYEN, VU ANH

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

09/24/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/554,707	<b>Applicant(s)</b> ONODERA ET AL.	
	<b>Examiner</b> Vu Nguyen	<b>Art Unit</b> 1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/27/2005, 05/18/2006</u> .                                  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 2 is objected to because of the following informalities: "An" should be changed to "The". Appropriate correction is required.
2. Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is not clear if claim 5 is meant to be an independent claim or a dependent claim. If it depends on claim 1, it fails to further limit the scope of claim 1. If it is an independent claim, it should be re-written to avoid dependency on claim 1.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. These claims involve an "ultrahigh molecular weight polymer." It is not immediately obvious to one of ordinary skill in the art as to what range of molecular weight is considered ultrahigh molecular weight. In the interests of compact prosecution,

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pending rectification of this “ultrahigh molecular weight” term, this term will be understood, in the rejections below, as directed to a number-average molecular weight in a range of 2,000-100,000 for each of the structural units involved in the claims (as defined in the specification).

6. Claim 6 is further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase “...the same as defined above...” does not make it clear as to where said definitions are to be found.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

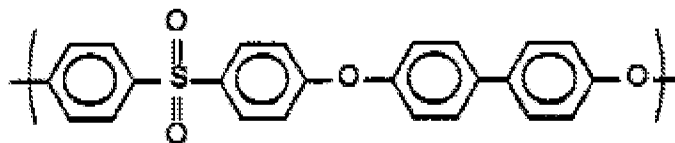
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5 and 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Formato et al. (WO 00/24796 A1).

9. Corresponding to the limitations set forth in these claims, Formato et al. (Formato, hereafter) teaches an aromatic-polyether-type ion-conductive polymer having an ion-exchange capacity of 0.5-4 meq/g (Claim 24); wherein the polymer is a sulfonated polyphenylsulfone homopolymer or copolymer or blends thereof (Claim 22). The general structure of the polymer (Claim 23) is represented by:

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Typical polymers employed in the disclosure include sulfonated products of Radel® R polyphenyl sulfone polymers (p. 39) commercially available from Amoco Polymers (p. 30). These polymers inherently possess molecular weight in the range of 2,000-100,000. Notes that sulfonation means introducing sulfonic acid groups to the polymer (p. 24, lines 4-9). Formato also teaches methods of introducing sulfonic acid groups to the polymer (p. 32, lines 23-28 & pp. 33-34). Also disclosed is a polymer electrolyte membrane comprising the aforementioned polymer (Claim 27). "Materials and membranes of the present invention may be used in a host of electrochemical applications, including...electrolysis; fuel cells,...water splitting,...as super acid catalyst" (p. 17, lines 4-11).

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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11. Claims 1-11 are rejected under 35 U.S.C. 102(a, e) as being anticipated by Yoshimura et al. (US 2003/0180596 A1).

12. Corresponding to the limitations set forth in these claims, Yoshimura et al. (Yoshimura, hereafter) teaches a polymer electrolyte to be used as proton conductive membrane of fuel cells and the like (Abstract). The polymer electrolyte, having an ion-exchange capacity of 1.2-1.6 meq/g (Table 1), comprises an "aromatic polymer comprising an aromatic ring in a main chain and a super strong acid group in a side chain" (Claim 1). The disclosed polymers include the polymer claimed in the instant invention (Claims 1-6). The number-average molecular weight of the disclosed polymers is 5,000-500,000 [0037]. The acid group includes sulfonic acid (Claims 5-6). A polymer electrolyte comprising the disclosed polymer as an effective component as well as a polymer electrolyte membrane comprising the disclosed polymer electrolyte and a fuel cell comprising said membrane are also taught (Claims 12-16). Note that a fuel cell comprises a catalyst composition having said polymer electrolyte as a constitutive component [0133-0134]. The prior art also teaches a process of preparing the disclosed polymer electrolyte, comprising a step of synthesizing the polymer and a second step of reacting said polymer with a sulfonic acid-containing group (Claims 7-11). One of the disclosed methods of synthesis of the aromatic polymer comprising subjecting an aryl dihalide to Yamamoto polymerization using a zerovalent transition metal catalyst [0069-0072]. The aryl dihalide includes aryl dichloride and aryl dibromide [0070].

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Nguyen whose telephone number is (571)270-5454. The examiner can normally be reached on M-F 7:30-5:00 (Alternating Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vu Nguyen  
Examiner  
Art Unit 1796

***/David Wu/  
Supervisory Patent Examiner, Art Unit 1796***